REMARKS

Claims 7 and 15 have been cancelled. New claims 19 and 20 have been added. Claims 1-6, 8-14, and 16-20 are currently pending in the application.

The Examiner rejected claims 8, 17 and 18 under 35 USC § 102(e) as being anticipated by Morris et al. (6,665,010; hereinafter "Morris"). The Examiner rejected claims 1-6, 9-14 and 16 under 35 USC § 103(a) as being unpatentable over Morris in view of Abe (6,747,698). Applicant requests reconsideration of the application.

102(e) Rejection

When evaluating a claim, the claim as a whole must be considered, and as such, every limitation in the claim must be considered. MPEP § 2106. In order for a reference to anticipate an invention, each and every element of the claimed invention must be found in a single reference. "The identical invention must be shown in as complete detail as is contained in the...claim." MPEP § 2131.

Independent claims 8 and 17 recite "wherein the output signal values have signals that are generated from pixels within at least two physically separate rows within the array." One embodiment of this aspect of the claimed invention is shown in Applicant's figure 4b. One signal line (80) is used per row in the pixel array, but each signal line is routed to pixels in two adjacent rows. The vertical solid lines attached to each horitzonal dashed lines illustrate the routing of the signal lines to pixels in two adjacent rows. Routing each signal line to pixels in two adjacent rows allows each row of data readout from the sensor to include the data from the pixels in the two physically adjacent rows.

The Examiner argues Morris teaches Applicant's claim limitation of "wherein the output signal values have signals that are generated from pixels within at least two physically separate rows within the array" in lines 9-31 in column 7. Lines 9-31 in column 7 of Morris state:

> Referring back to FIG. 5, to take a snapshot of an image during the normal mode, the pixel sensing units 118 accumulate energy over the respective integration intervals to electrically indicate intensities for the captured image. Next, the row decoder 121 begins retrieving the stored indications of these intensities from the pixel sensing units 118 by selectively, electrically selecting rows of the pixel sensing units 118. Once selected, the pixel sensing unit 118 transfers the indication of its intensity value to signal conditioning circuitry 126. A column decoder 122 may be used to select groups of the indications for each row. The signal conditioning circuitry 126 may, for example, filter noise from the indications and convert the indications into digital data before transferring the data to an output interface 128. The output interface 128 may include buffers for temporarily storing data and circuitry to interface the imager 140 to external circuitry (other components of a digital camera, for example). The image 140 might also include, for example, the control unit 129 which has circuitry such as state machines and timers to control the scanning and data flow through the chip 54 and control the durations of the integration intervals that are set by the time measurement circuits 130.

The Examiner argues this description teaches Applicant's claimed limitation because "the signal values that are generated from the array of pixel sensing units 118 are transferred to output interface 128." Although the statement regarding the transfer of signal values to the output interface is correct, Morris does not teach the output signal values have signals that are generated from pixels *within at least two physically separate rows within the array*. Nothing in figure 5 teaches or suggests routing each signal line to pixels in two adjacent rows.

In fact, Morris describes a prior art method of reading out data from an image sensor. The row decoder selects a row within the array and the column decoder selects which column (pixel) or columns (pixels) within the selected row to readout. The row decoder does not select another row until all of the pixels within the selected row are readout. Morris expressly states the row decoder can be used to select groups of the indications *for each row* (col. 7, lines 18-19).

And finally, Morris illustrates a pixel sensing unit 118 in figure 8. Nothing in this figure teaches or suggests routing each signal line to pixels in two adjacent rows. Morris does not show or describe having a signal line routed to

pixels in two adjacent rows. Therefore, for at least the following reasons, Morris does not anticipate Applicant's independent claims 8 and 17.

"Claims in dependent form shall be construed to include all the limitations of the claim incorporated by reference into the dependent claim." 37 CFR § 1.75. Claim 18 depends from and includes all of the limitations of independent claim 17. For at least the reasons discussed above, Morris does not anticipate independent claim 17. Accordingly, dependent claim 18 is also not anticipated by Morris.

103(a) Rejection

The Manual of Patent Examining Procedure (MPEP) states the following in Section 2143:

> To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

Applicant submits the combination of Morris and Abe does not render Applicant's claims 1-6, 9-14 and 16 obvious because the combination does not meet the three basic criteria.

Independent claims 1 and 9 recite "a color filter pattern spanning at least a portion of the pixels, wherein the color filter pattern forms a plurality of color filter kernels having the same colors in a predetermined arrangement wherein the kernels are arranged in at least two different uniformly distributed sets" and "a mechanism for controlling integration time of the different sets of kernels according to their spatial location, wherein the integration time is different for each set of the kernels." The Examiner states the following on page 5 of the office action:

> Morris et al. fails to specifically disclose the plurality of color filter kernels having the same colors in a predetermined arrangement. Hoever, Abe teaches a digital camera 10 in which the color filter 13 is divided into a 2x2 pixel matrix M1, each pixel matrix M1 has the same plurality of colors R, G, B. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device in Morris et al. by the teaching of Abe in order to reduce the chromatic blur which occurs in a reproduced image because of the interpolating process.

Applicant respectfully submits there is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify Morris in view of Abe or to combine Morris with Abe.

Figure 2 in Abe does depict the Bayer pattern and states the color filter is divided into a 2x2 pixel matrix M1, where an R color filter element is positioned at the upper-left corner, a G color filter element is positioned at both the upper-right corner and the lower-left corner, and a B color filter element is postioned at the lower-right corner. Abe also states the pixel signals forming a predetermined arrangement pattern are extracted from all the pixel signals, and are classified into first, second, third, and fourth patterns (col. 3, lines 24-29). A pattern-setting unit extracts all of the signals from the R color filter elements (upper-left corners) in the entire image to form the first pattern. Similarly, the pattern-setting unit extracts all of the signals from the upper-right corner G color filter elments in the entire image to form the second pattern, all of the signals from the lower-left corner G color filter elements in the entire image to form the third pattern, and all of the signals from the lower-right B color filter elements in the image to form the fourth pattern. A particular interpolation process routine is then performed on each different pattern in order to reduce the chromatic blur that occurs in a reproduced image because of the interpolation process (see col. 1, lines 40-43 and col. 4, lines 1-38).

First, Applicant's claimed invention is directed at extending the dynamic range of an image sensor. In other words, Applicant's claimed invention

extends the range of light levels that can be captured and rendered in a single image capture from an image sensor. The invention in Abe, on the other hand (and as noted by the Examiner on page 6 of the office action), reduces the chromatic blur that occurs in reproduced images due to the color interpolation process. Reducing chromatic blur that occurs in reproduced images due to the color interpolation process does not extend the dynamic range of an image sensor. Similarly, extending the dynamic range of an image sensor does not reduce chromatic blur.

Second, although the color filter in Abe is shown divided into a 2x2 pixel matrix M1, the signals from all of the same colors in the image are treated the same. The signals from all of the R color filter elements are extracted together and interpolated using a particular interpolation process. The same is true for the G and B color filter elements. Thus, although Abe depicts the Bayer color filter as being divided into 2x2 matrices, this has not effect on the treatment and processing of the signals. Abe expressly teaches treating the signals from the same color filter elements the same.

"The mere fact that references can be combined or modified does not render the resultant combination obvious unless the results would have been predictable to one or ordinary skill in the art. (citing KSR International v. Teleflex Inc., 550 U.S. __, __, 82 USPQ2d 1385, 1396 (2007))." MPEP Section 2143.01 (emphasis original). Applicant respectfully submits there is no suggestion or motivation to either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify Morris in view of Abe or to combine Morris with Abe to teach Applicant's claimed invention.

Moreover, Section 2141 of the MPEP states:

> The key to supporting any rejection under 35 USC 103 is the clear articulation of the reason(s) why the claimed invention would have been obvious. The Supreme Court in KSR noted that the analysis supporting a rejection under 35 USC 103 should be made explicit.

> The Court quoting *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006), stated that '[R]ejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness. KSR, 550 U.S. at ___, 82 USPQ2d at 1396.

Applicant respectfully submits the Examiner did not provide an articulated reasoning with some rational underpinning as to why a person of ordinary skill in the art would modify Morris by the teachings in Abe. The only reason given by the Examiner is that the modification would "reduce the chromatic blur which occurs in a reproduced image because of the interpolation process." The invention in Morris, as well as Applicant's claimed invention, are not directed at reducing chromatic blur. The one illustration in figure 2 in which the Bayer color filter arrangement is divided into 2x2 matrices does not provide such motivation or suggestion, especially since Abe expressly teaches treating all of the signals from the same color filter elements the same.

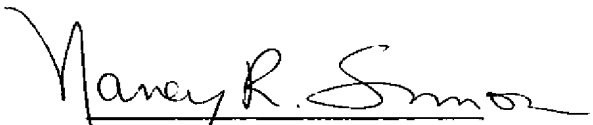
Based on the foregoing, Applicant respectfully submits the Examiner has failed to establish a prima facie case of obviousness. Additionally, Applicant submits the combination of Morris and Abe does not teach or suggest "a color filter pattern spanning at least a portion of the pixels, wherein the color filter pattern forms a plurality of color filter kernels having the same colors in a predetermined arrangement wherein the kernels are arranged in at least two different uniformly distributed sets" and "a mechanism for controlling integration time of the different sets of kernels according to their spatial location, wherein the integration time is different for each set of the kernels." Therefore, Applicant's independent claims 1 and 9 are not rendered obvious in light of Morris and Abe.

Claims 2-6 depend from independent claim 1 and claims 10-14 and 16 depend from independent claim 9. "If an independent claim is not rendered obvious by prior art, then any claim depending from the independent claim is not obvious. " In re Fine, 5 USPQ2d 1596 (Fed. Cir. 1988) (see also M.P.E.P. § 2143.03). Since the combination of Morris and Abe does not render independent

claims 1 and 9 obvious, dependent claims 2-6, 10-14, and 16 are also not obvious in view of Morris and Abe.

In view of the foregoing it is respectfully submitted that the claims in their present form are in condition for allowance and such action is respectfully requested.

Respectfully submitted,



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